Summary of LDS Hospital methodology for PFT Readings

Data from the HABC field centers was initially transferred to us by copying the data to a 3$_{1/2}$-inch floppy disk and mailing the disk to our laboratory. There were a few problems with this transfer method. 1) the disks were occasionally damaged (magnetic fields were suspected) so that the disks were unreadable at our facility. 2) Sometimes there were "lost" disks and 3) the data that was transmitted was occasionally not complete and additional data was then requested from the field centers. We gradually converted to "e-mail" transfers for the data where the data files were sent as an attachment to a standard e-mail transmission.

The data files are the exact data files produced from the NIOSH spirometer systems. That is they are in format that John Hankinson developed when he worked at NIOSH. These files is read by our quality control software where the spirometry tracings are displayed on a computer screen in either flow-volume or volume-time formats and numerical data is shown in a table. The quality of the three aspects for each subject are then graded by one of the reviewers. Grades are given to flow, FVC (Forced Vital Capacity) and FEV1.0 (Forced Expiratory Volume in one second). These measures are the primary outcome variables from the spriometry and assigning them individual quality scores allows the use of each variable independently regardless of the quality score of the other two variables.

Grades on FVC and FEV1.0 are based primarily on reproducibility of the measurements, and proper performance of the test procedures. We use the American Thoracic Society's published recommendations for the assessing the quality. Quality scores were assigned the letter grades A,B,C,D and F. Data should only be analyzed when its quality score is C or better. The quality scores are assigned using the following guidelines:

FVC & FEV1.0 – QC Scores *:

A: Best two values differ by less than 100 ml

B: Best two values differ by less than 200 ml

C: Best two values differ by less than 300 ml

D: Best two values differ by less than 400 ml

F: Best two values differ by more than 400 ml

Flow QC Score *:

A: Best two peak flow values are within 10%

B: Best two peak flow values are within 15%

C: Best two peak flow values are within 20%

D: Best two peak flow values are within 25%

F: Best two peak flow values are greater than 25%

* If the test only collected two spirometry tracings the best score can only be a B and if there is only one tracing the quality score is at best a D (unusable data) regardless of the quality of the effort. Furthermore, for FEV1.0 the score is lowered if the quality score for flow is a D or F because of the possible impact of low flow contributing to an underestimation of the FEV1.0.

Every tracing is also examined for premature end of flow due to closure of the glottis; if found on both the best tracings the FVC QC score is lowered to at least a D. If the closure occurs after 1 second, the FEV1.0 QC score is unaltered; however, if the closure occurs before one second then the FEV1.0 score is also lowered to at least a D.

Tracings are also examined for coughs. If a cough is found before one second then the FEV1.0 QC score is lowered by at least one letter grade regardless of the reproducibility.